



## Legal Disclaimer

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## Agenda



Time	Topic	Owner
13.00 – 13.05	• Introductions	Thilman Vaughn
13.05 – 13.10	• Safety moment	Thilman
13.10 – 13.30	• NK Facility <ul style="list-style-type: none"> <li>– 2020 Operations</li> <li>– TARoverview</li> </ul>	Laws / de Wit
13.30 – 15:25	• Galapagos LSPS <ul style="list-style-type: none"> <li>– Diagnostic work update</li> <li>– Long-term repair options</li> <li>– Co-owner perspective</li> </ul>	Parimi Redding Co-owner
15.25 – 15.30	• Close	All



## Safety Moment: Metal Drinking Straws

METAL DRINKING STRAWS gained popularity as an alternative to plastic straws because they are reusable and considered friendlier to the environment. Plastic straw bans are also becoming more commonplace.

Typically made of stainless steel, these straws can be a reliable substitute to sip your lunchtime drink, but the sturdy construction merits considerations for safe use.

### Incidents

- In 2019, a fatal injury occurred when a consumer tripped while carrying a cup with a metal straw inserted into a fixed lid<sup>1</sup>
- Other bodily injuries have resulted from falling onto the straws
- Injuries to the mouth have also occurred
  - In 2016, Starbucks recalled 2.5 million straws after reports of children cutting their mouths on sharp edges<sup>2</sup>

### Staying safe

- Never use metal straws with a fixed lid. The straw should be able to move freely and out of the way
- Similarly, do not use with bottles or anything else with a narrow opening
- Avoid using while in motion (walking, riding in a car, etc)
- Reconsider allowing children to use metal straws
- Review other alternatives to see if they are right for you: silicone, paper, candy, no straw at all!



<sup>1</sup><https://www.nytimes.com/2019/07/11/world/europe/metal-straws-death.html>

<sup>2</sup><https://www.nbcnews.com/business/consumer/starbucks-recalls-2-5-million-metal-straws-after-reports-mouth-n622161>



## Na Kika Facility Operations

### Safety / Regulatory

Topic	2019	2020 Jan - Sep
Personal Safety	0 DAFWCs, 2 RI, 9 FAs	0 DAFWCs, 3 RI, 5 FAs
Process Safety	LOPC's: 33 H, 3 G+ 2 HiPo	LOPC's: 18 H, 1 G+ 0 HiPo
Regulatory	1 Spills, 4 INCs, 0 835s	0 Spills, 0 INCs, 3 835s

### Safety Focus

- Process isolation and reinstatement
- Risk barrier health
- Learning and action management
- Alarm rationalization
- Override management

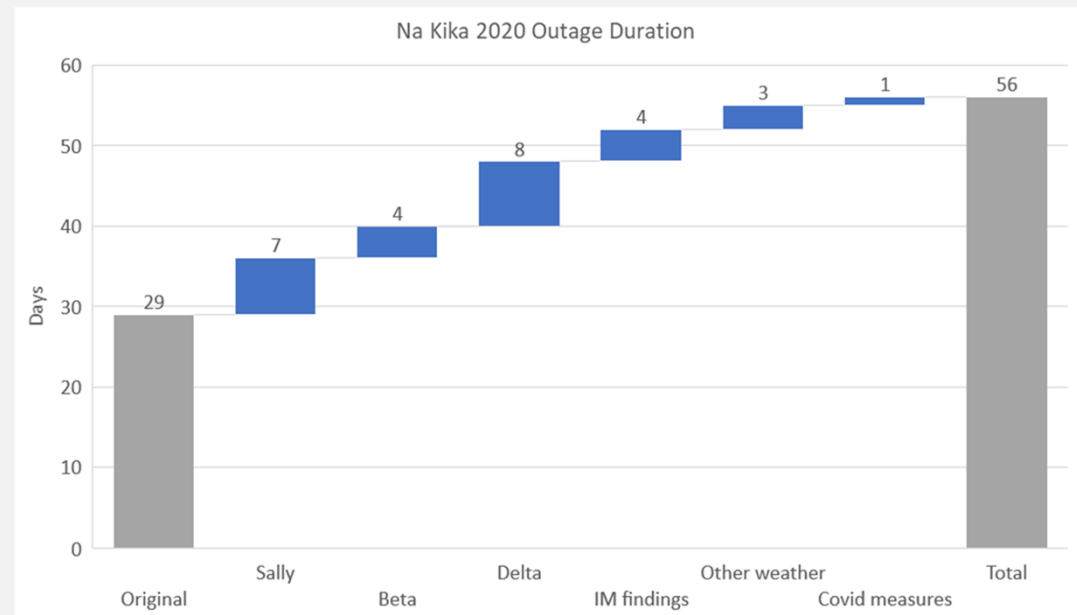
### Operations

- Reliability
  - Galapagos PLEM ingress/egress identification: Corrective action plan in progress (see later slides)
  - Isabella and SA/SC FCVs expected 10/28  
Installation will require loop outage
  - SA/SC SDV and AOV actuators both replaced  
Mitigations: spare actuator, hydraulic fluid assessment
- Schedule
  - Outage to complete October 27<sup>th</sup> (see next slide)
  - Post-outage activities include west crane sheaves, riser and umbilical pull-ins, Genovesa commissioning and startup, RGLC overhaul
- 2020 Gross operating costs
  - Ongoing efforts to reduce normalized operating costs
  - Discretionary work delayed to 2021
  - Increased spending for Covid-19 mitigation
- 10-year Facility Life Extension
  - Work in progress: expanded living quarters, compressor enclosures, HVAC systems, Honeywell and DCS upgrades, anode on wire rope
  - Scope for next 3 – 5 years under development



## Na Kika Turnaround

- 2020 Outage
  - Expected finish date is Oct 27 – impacted by storms Laura (delayed start), Sally, Beta, Delta
  - 1500 hr discovery work: flange replacement and multiple flange face machining, switch gear repair, flare IM findings
  - Upcoming AFE supplement anticipated to reflect increase in costs of 25-40%
- Next Turnaround in April 2022



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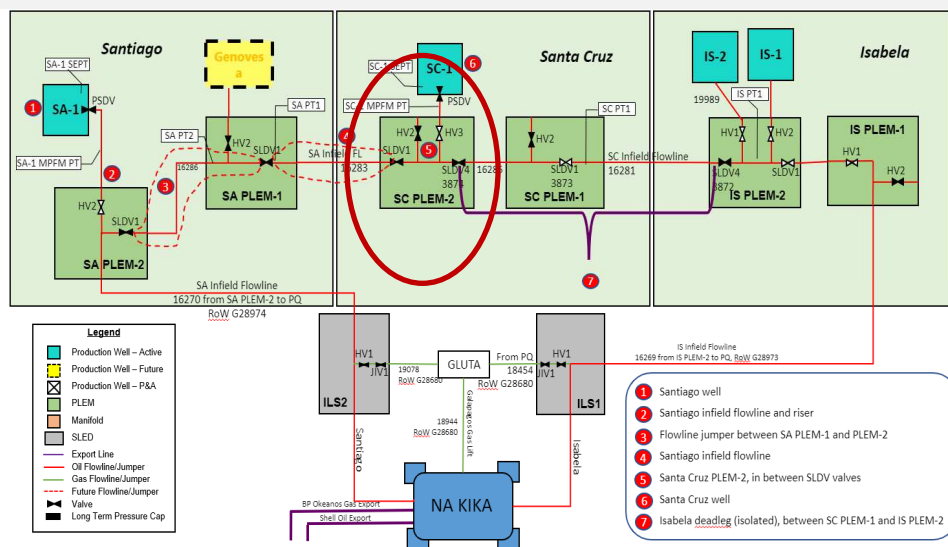
## LSPS Diagnostic Campaign

- Campaign 1 – Insulation Removal
- Campaign 2 – Corrective Action Plan
- Campaign 3 – Hydrate Remediation & CAP
- Contingency & Subsea Repair Options
- Costs to date - \$2.68m





## Loop Schematic & SC PLEM 2 Valve



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## Campaign 1 - Insulation Removal Summary (9/3)

- Insulation removal authorized on SLDV1 at SC2 PLEM (5k Water Blaster instead of CT)
  - Target 1: Grease port not located on starboard side. Identified as NPT Plug
  - Target 2: Grease port located. Lockwire appears functional & installed correctly
  - Target 3: Large section removed, indicating lack of adhesion/bonding to the valve



Target 1 Starboard



Target 2 Port



Target 3 Vertical Section

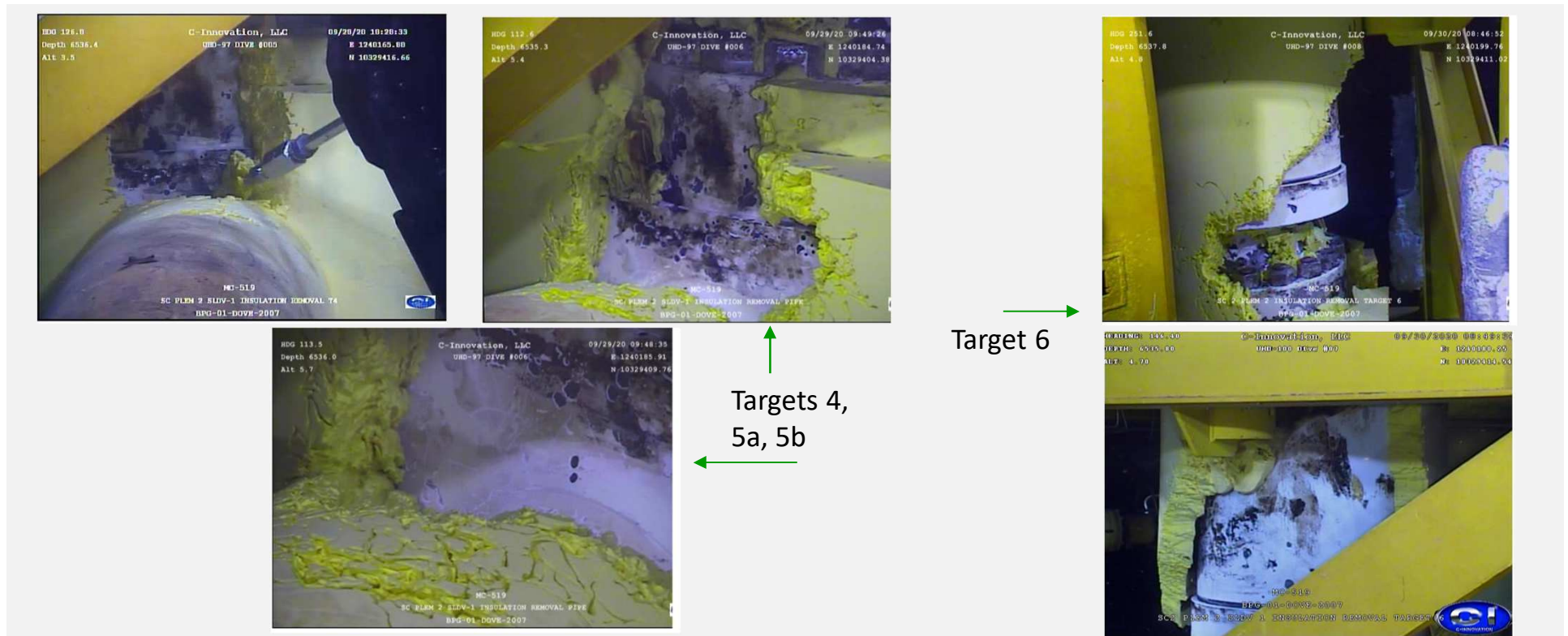


## Campaign 2 – Corrective Action Plan Summary (9/25)

- Received BSEE Approval of CAP on 9/14. Mobilization planned for 9/18
  - Install containment dome
  - Increase pressure in the PLEM
  - Confirm egress at grease ports
  - Tighten grease ports and reinstate
- Campaign started on 9/25 (weather delays)
- Pressurization through BH3 cap failed due to lack of bore communication
- *Additional Insulation Targets added to scope*
  - *Target 4 ,5a/5b (Follow the path of staining)*
  - *Target 6 (Revisit Target 3)*



## Campaign 2 - Insulation Removal Summary (9/25)



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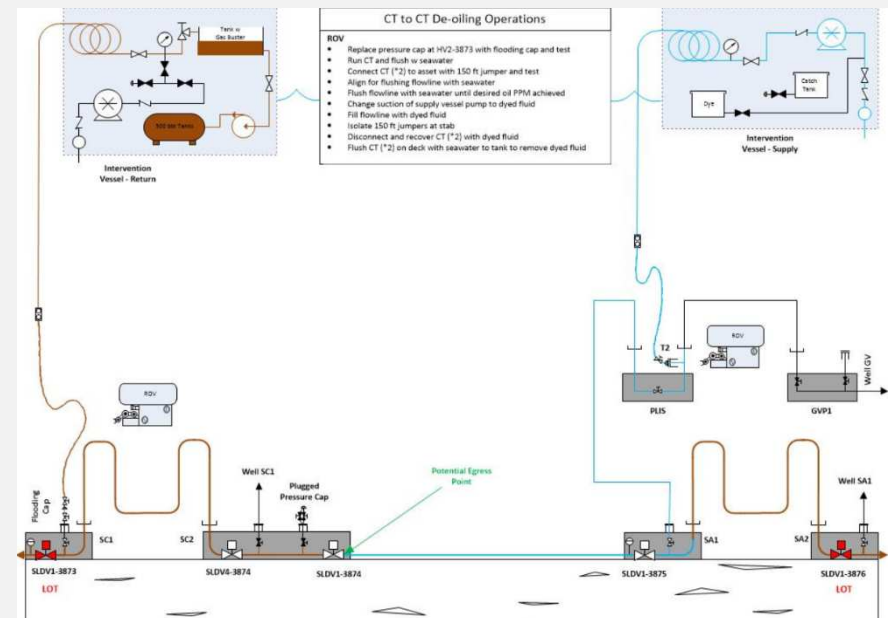
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## Contingency Options – De-Oil Subsea Repair



- De-oiling campaign:
  - Equipment Readiness: Nov 15<sup>th</sup>
  - Contingency only. No planned execution date.
- Subsea Repair:
  - Develop repair options focusing on in-situ repair
  - Options include valve repair, pressure containment device (clamp), etc.
  - Dependent on leak location





## Path Forward - Diagnostics

- Review ROV Video and Pressure trends
- Dead Oil Circulation (increase temperature)
- Develop accurate 3D model by using HD Video from Campaign 3
- Develop clamp or pressure containment device designs once egress points are known
- Continue to engage BSEE on new CAPs
- LSPS AFE – Diagnostic costs will be charged to the joint account until root cause and liability are determined which may result in an adjustment to the Genovesa operator being the sole responsible party.



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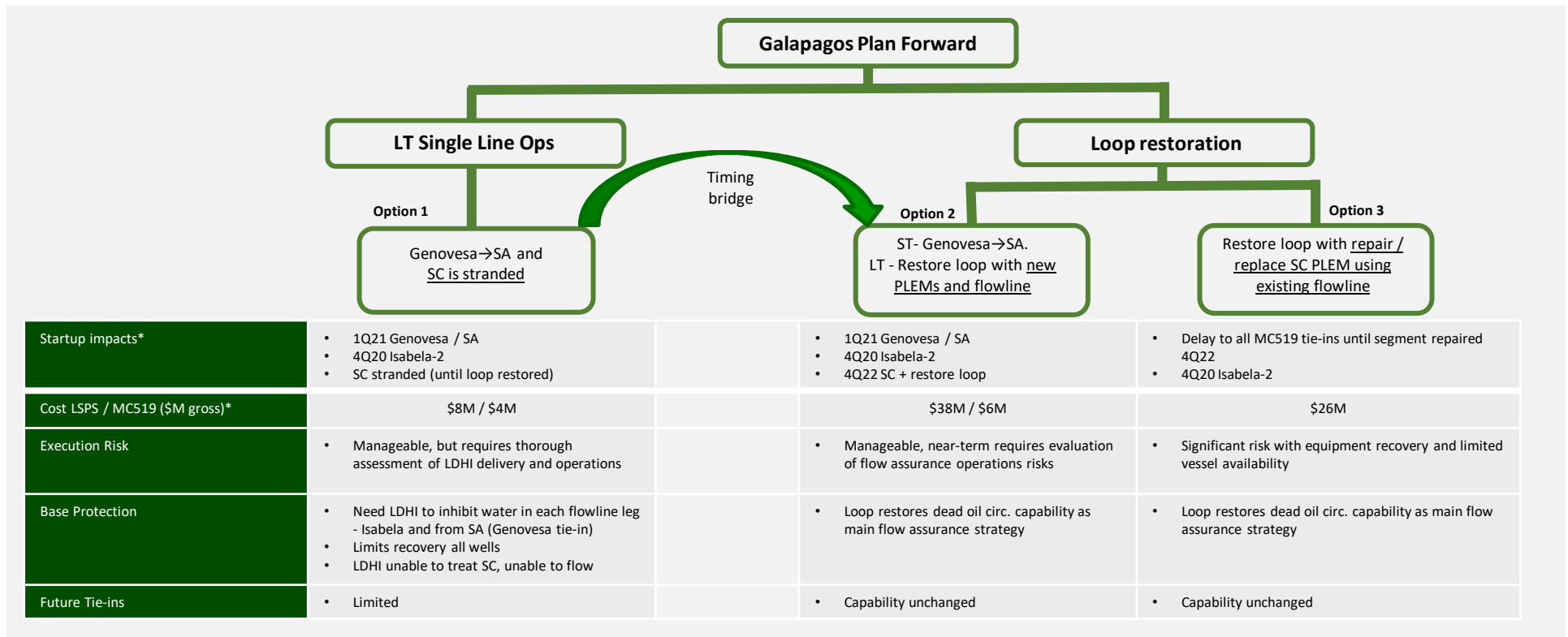


## Considerations for Restoring LSPS Operations

- Several scenarios considered for restoring LSPS Operations in the event a short-term remediation at SC PLEM valve is not successful:
  - Operate as single leg tiebacks (temporarily or long-term)
  - Temporary bypass loop for flow assurance circulations only
  - Restore loop functionality through replacement of segment/jumpers
  - Restore loop functionality through repair/replacement of SC PLEM
- Key assumptions on schedules for Concept Screening
  - Confirming necessity for long-term concept by end Oct 2020
  - Concept selection decision and funding approvals by end 2020
  - Execute procurement with suppliers in early 1Q21
- Note, estimates are at a concept screening level and require further engineering, and cost reviews.



## LSPS Narrowed Repair Options

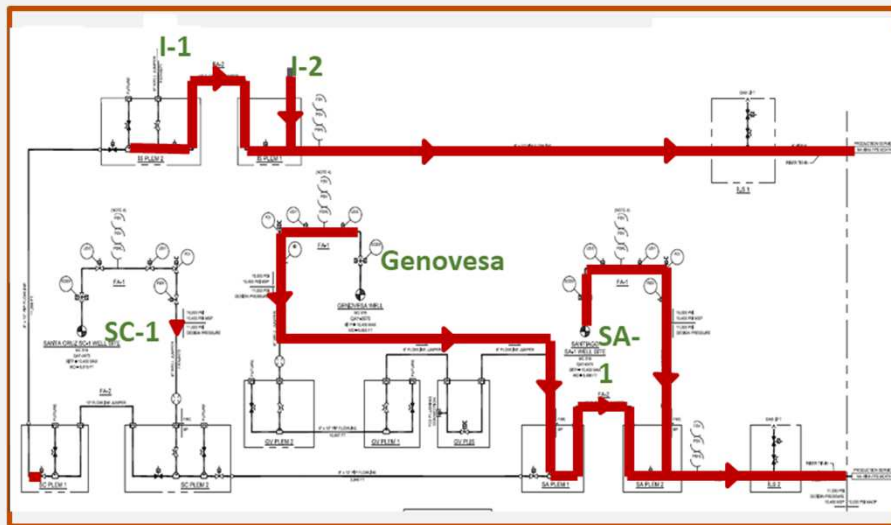


\*Cost and schedule references are estimates only and based on early screening and benchmark costs (+/-25%)

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## LSPS Repair Options – Single-leg Scenario



### To resolve:

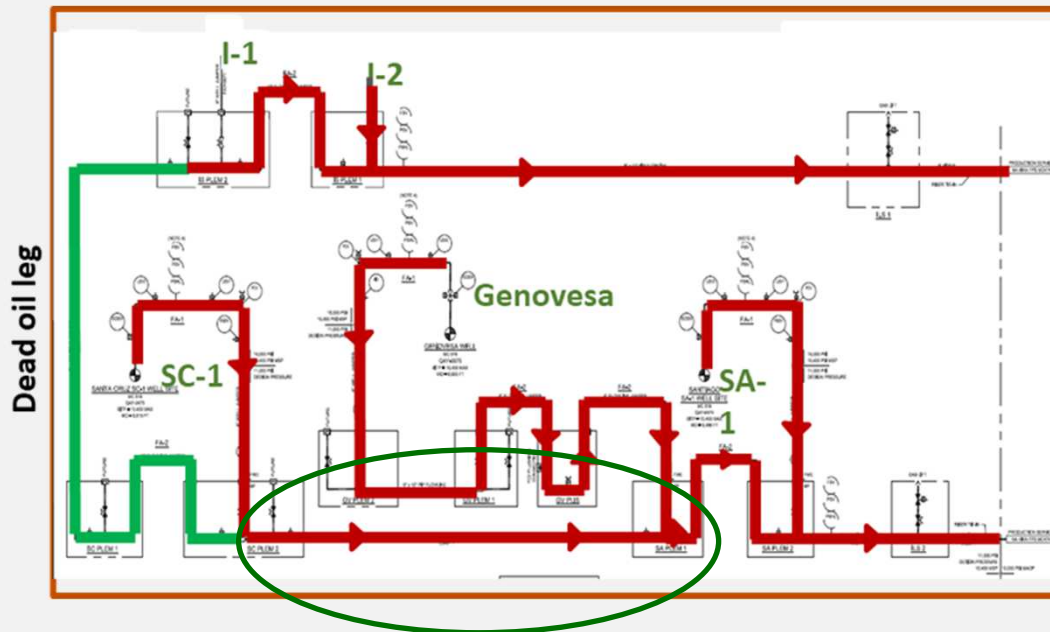
- Chemical storage capacity
- Chemical pump delivery and injection location
- Operational risk reviews of SA/GEN flowing scenarios

### Comments:

- Santa Cruz cannot flow due to water cut being too high to treat successfully with LDHI.
- LDHI required to hydrate inhibit water from Isabela and SA drill centers as hydrate mitigation
- Align on regulatory strategy around preserving options with reinstating loop and stranded SC1.
- Operational complexity using WCUS to Wet Hull Flow Assurance tanks route to divert fluids from Santiago flowline while ramping up with LDHI to avoid sheens
- Above results in downtime each startup, significant challenges on timing of sequenced activities with other NK operations
- Potential slugging/low arrival temperature if SA-1 is shut and Genovesa is flowing SOLO after ~1.5 - 2 years from first oil (risk of not flowing entire profile)



## LSPS Repair Options – Restored Loop



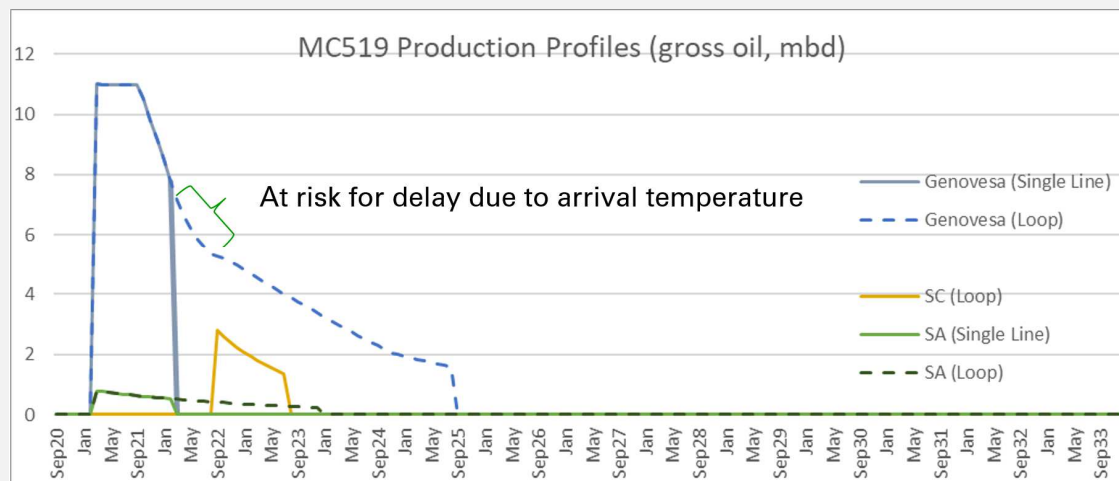
### Comments:

- Near-term alignment on decision path and regulatory strategy to retain option/reinstatement
- Santa Cruz returned to operations with dead oil circulation (DOC) capability re-established.
- Operational costs, complexity and sheening risks associated with LDHI removed with ability to DOC



## LSPS MC519 Single Line vs Loop recovery

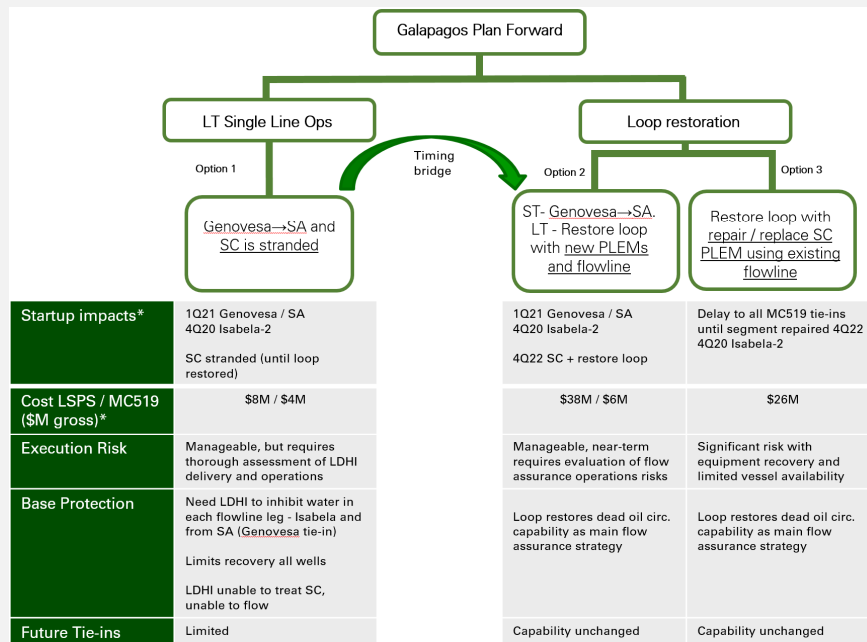
### Preliminary Screening – More work to be complete



- Loop Restoration Path
  - Genovesa routes to SA Plem in immediate time and can flow until arrival temperature or water cut exceeds limits
  - Preliminary FA work shows no risk to current forecasts once loop is restored
- Single Line Operational Path
  - Limited to LDHI treatable water cut of 60%
  - Preliminary FA work shows risk to Genovesa after the first 1.5-2 years of flow due to arrival temperatures dropping into hydrate formation window.
  - Due to sheen management with LDHI, expect downtime ahead of ramp-ups to be ~15 days



## LSPS Repair Options Summary



### Initial views

- From a long-term recovery perspective restoration of the loop appears to be the best option

### Next Steps

- BP to continue updates with diagnostic work
- Progress contingency concept work until confirmed short-term vs. long-term or combination
- Align on forward scenario, enabling more focus on optimizing plan to confirm concept
- Define LDHI delivery to SA area
- Review operational risks for SA/GEN cases up SA riser, as single-leg option (if supported)

### Requests to MC519 co-owners

- Share operational plan and production profile for GEN/SA to update integrated flow assurance
- Identify strategy for LDHI injection if flowing GEN without SA

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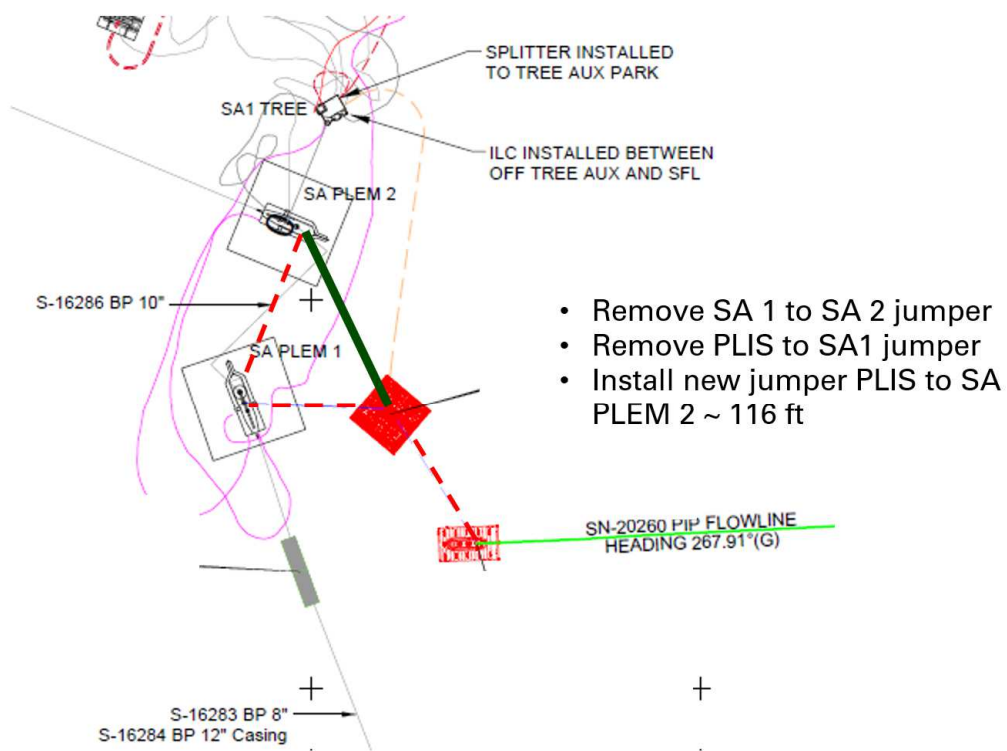


Back-up





## Option 1– Connect Genova to SA PLEM 2



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